

SHORT COMMUNICATION

Notes on the distribution of *Berlandina nubivaga* with the description of the male (Araneae, Gnaphosidae)

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Abstract. Fourteen adult specimens of *Berlandina nubivaga* (Simon 1878) (two females and twelve males) were collected in Aosta Valley (NW Italy) by pitfall traps mostly placed in alpine pastures at about 2000 m elevation. The male is described and the palpal morphology is illustrated; a new drawing of the female internal genitalia is also given. The critical analysis of previous records suggests the distribution of *B. nubivaga* may be restricted to the Alps.

RIASSUNTO. Quattordici esemplari (due femmine e dodici maschi) di *Berlandina nubivaga* (Simon 1878) sono stati raccolti in Val d'Aosta (Italia nord-occidentale) con l'impiego di trappole a caduta collocate per lo più in pascoli intorno ai duemila metri di quota. Il maschio di questa specie risulta nuovo per la scienza: in questa sede viene quindi descritto illustrandone i caratteri sistematici salienti. Viene inoltre fornita una nuova illustrazione della vulva della femmina. L'analisi critica delle segnalazioni di *B. nubivaga* sembra suggerire che la distribuzione di questa specie sia ristretta alle Alpi.

Keywords: Ground spider, taxonomy, morphology, alpine spiders, Italy

During an ecological study focused on the impact of ski runs on alpine arthropod communities in Aosta Valley (NW Italy), fourteen specimens (two females and twelve males) of gnaphosids of the genus *Berlandina* Dalmas 1922 were found. Features of the female epigynum and internal genitalia identified the specimens as *Berlandina nubivaga* (Simon 1878), which is known from only few European localities. The male of this species is new to science; it is therefore described here for the first time and its palpal morphology is illustrated. A new drawing of the female internal genitalia is also given. Previous records from the Balkan Peninsula are doubtful; they are therefore analyzed critically in order to determine the true distribution of this species.

METHODS

A stereoscopic binocular Wild M5 was used for the description. All measurements are in mm. The following abbreviations are used in the text: d = dorsal; v = ventral; pl = prolateral; rl = retrolateral; ALE = anterior lateral eyes; AME = anterior median eyes; PLE = posterior lateral eyes; PME = posterior median eyes.

Specimens are preserved in 75% ethanol and are lodged in Marco Isaia's collection at Turin University, Dipartimento di Biologia Animale e dell'Uomo (DBAU) and in the collection of Museo Civico di Storia Naturale "E. Caffi", Bergamo, Italy (MCSN).

TAXONOMY

Family Gnaphosidae Pocock 1898
Genus *Berlandina* Dalmas 1922

Type species.—*Gnaphosa plumalis* O. Pickard-Cambridge 1872, by original description.

Berlandina nubivaga (Simon 1878)
Figs. 1–4

Pythonissa nubivaga Simon 1878:197.

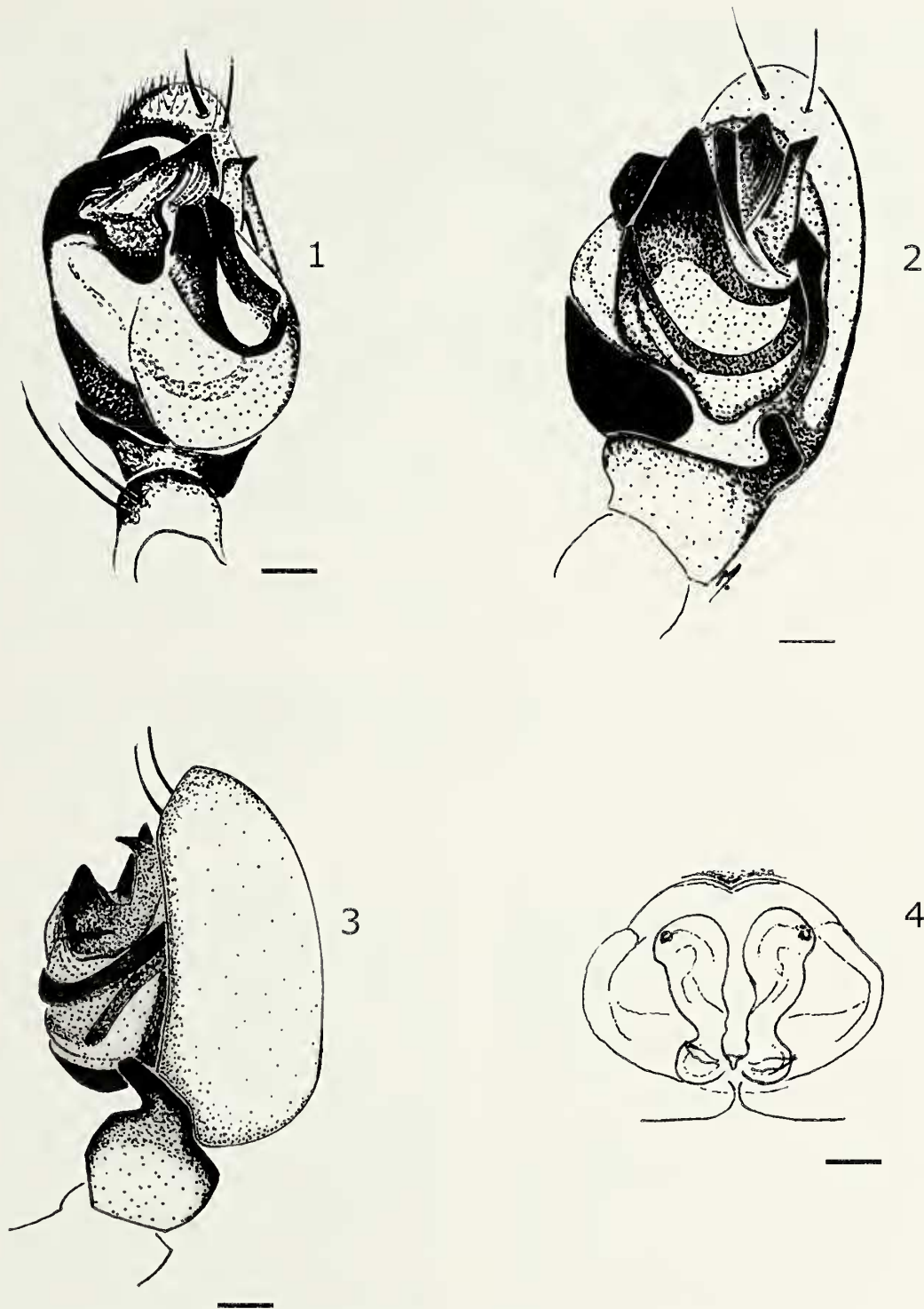
Pterotricha nubivaga (Simon): Simon 1914:190, 222.

Berlandia nubivaga (Simon): Dalmas 1921:274, fig. 50.

Material examined.—ITALY: *Aosta Valley*: 12 ♂, 2 ♀, Torgnon, pitfall traps, 16–30 June 2006, M. Negro A. Rolando (10 ♂, 1 ♀ in DBAU; 2 ♂, 1 ♀ in MCSN).

Diagnosis.—Opisthosoma dark brown, dorsally and distally marked with blackish chevron-like stripes. Spinnerets blackish. Scutum small. Scopula of tarsus and metatarsus I and II slightly developed. Palpus with relatively small tibial apophysis, short and bent ventrally. Embolus distally triangular, bearing several sclerotized rims on its surface.

Description.—*Male*: Prosoma and opisthosoma dark brownish, dorsally with blackish chevron-like stripes. Opisthosoma laterally with two dark bands, starting below the middle and ending close to spinnerets. Spinnerets blackish, with three spigots. Scutum present, small. Anterior eyes in a procurved row (frontally), posterior row recurved (from above). AME smaller than ALE, PME very small. Chelicerae without lateral condyle. Inferior margin of chelicera with serrated keel, anteriorly with several strong bristles. Leg spination: tarsus I–IV: absent; metatarsus I–II: 4 v (in two longitudinal rows at side, with two spines each); metatarsus III: 6 d, 3 v, 3 rl, 2 pl; metatarsus IV: 5 d, 5 v, 5 pl, 4 rl; tibia I: 5 v (in two longitudinal rows at side, 2 prolaterally, 3 retrolaterally); tibia II: 4 v (in two longitudinal rows at side, 1 prolaterally, 3 retrolaterally); tibia III: 5 d; 6 v, 4 rl, 4 pl; tibia IV: 4 d, 6 v, 4 rl, 4 pl; patella I–II: absent; patella III: 2 d (nearly pl), 1 rl; patella IV: 1 d (nearly pl), 1 rl; femur I–II: 3 d, 1 pl (distal); femur III–IV: 3 d, 2 pl, 2 rl. Scopulae on tarsus and metatarsus I–II present, only slightly developed. Tarsal claws with seven teeth. Male palp (Figs. 1–3): cymbium oval, with mat of dense bristles dorsally and apically, tibial apophysis relatively small, short and bent ventrally, ending in a sub-rectangular blade-like process. Bulbus apically armed with three laminae (sensu Levy 1999): a retro-lateral one, slender and directed outward; median and ventral ones separated by transparent membranous lamella. Embolus distally triangular, bearing several sclerotized ridges on its surface. Measurements of illustrated male (in millimeters): total length (without spinnerets) 6.00; prosoma length 4.67; prosoma width 2.26; opisthosoma length 3.00; opisthosoma width 1.93; clypeus 0.23; chelicera 0.70; fangs 0.17; distance between eyes: AME–AME 0.14, AME–ALE 0.11, PME–PME 0.16, PME–PLE 0.13; ALE–ALE 0.30, PLE–PLE 0.47. Leg I: femur 1.61, patella 0.81, Tb 1.16, metatarsus 0.81, tarsus 0.84, total leg length 5.23; Leg II: femur 1.26, patella 0.71, Tb 0.81, metatarsus 0.84, tarsus 0.90, total leg length 4.52; Leg III: femur 1.35, patella 0.71, Tb 0.81, metatarsus 1.10, tarsus 0.97, total leg length 4.94; Leg IV: femur 1.81, patella 0.87, Tb 1.35, metatarsus 1.94, tarsus 1.13, total leg length 7.10.



Figures 1–4.—*Berlandina nubivaga* (Simon 1878) (hair omitted): 1. Left male palp, ventral view; 2. Left male palp, ventrolateral view; 3. Left male palp, lateral view; 4. Vulva of the female, *adnexae*, dorsal view. Scale lines = 0.1 mm for all illustrations.

Remarks.—The female was identified using the descriptions by Simon (1878, 1914) and the illustrations by Grimm (1985) and de Dalmas (1921). A new illustration of the vulva is given (Fig. 4). Considering the shape of the embolus in the drawings of the male palp by Grimm (1985) and de Dalmas (1921), the species could be considered close to *B. cinerea* (Menge 1872) (Europe to Kazakhstan - not UK - Italy and eastern Mediterranean) and to *B. punica* (Dalmas 1921) (Algeria, Tunisia, Libya) (distributions after Platnick 2007).

Habitat and distribution.—Specimens were collected by pitfall traps situated primarily in alpine pastures at an average elevation of 1950 m with prevalent southern and eastern aspect (see next section). The species is known from a few localities in the French Alps (holotype from Hautes Alpes, Col de l'Echelle: Musée d'Histoire Naturelle, Paris) (Simon 1878), and in Switzerland (Wallis, Saas-Fee: coll. Wunderlich; Wallis, Fiesch: Naturhistorisches Museum, Berlin) (all information from Grimm 1985). *B. nubivaga* is recorded from Italy by



Figure 5.—Distribution—of *Berlandina nubivaga* (Simon 1878): dots refer to known localities. 1. F - Hautes Alpes, Col de l'Echelle; 2. I - Aosta Valley, Torgnon; 3. CH - Wallis, Saas- Fee; 4. CH - Wallis, Fiesch; 5. I - Province of Udine, Forno Avoltri; (1 after Simon 1878; 3, 4 after Grimm 1985; 5 after di Caporiacco 1926). Question marks refer to doubtful records in Macedonia and Bulgaria (see text). [Map taken from <http://www.planiglobe.com> accessed April 13, 2007, enhanced and elaborated with Photoshop 7.0 (Adobe Systems Incorporated)].

Pesarini (1995), di Franco (1997), and Trotta (2005) supposedly after the records published by Caporiacco (1926) who identified one female and one male (not described) from Carnic Alps (province of Udine, Forno Avoltri, ric. Marinelli, elev. 2122 m). This material was unfortunately not checked by us nor by Grimm (1985). The species is also recorded for Bulgaria (Drensky 1915, 1936 in Deltshv & Blagoev 2001) and Macedonia (Nikolia & Blagoev 2002, in Blagoev 2002). Literature records referring to *B. nubivaga* from Bulgaria (Drensky 1915, 1936; Nikolija & Polenc 1981) are unverifiable. A section of the Museum and a part of the Drensky's collection in which the assumed specimens of *B. nubivaga* were stored, were destroyed during the war (Deltshv 2007, pers. comm.). According to Deltshv (2007 pers. comm.), *B. nubivaga* does not occur in the Balkan Peninsula, and relevant misidentification is found in Drensky's collection. The same doubtful situation concerns *B. nubivaga* in Macedonia, for which no material is available. Deltshv's opinion is shared by T. Blick (2007, pers. comm.) who asserts that the only sure data are those from the western Alps. The record by Caporiacco (1926) from the eastern Alps seems to be plausible (Pantini 2007, pers. comm.) but needs confirmation. All in all, present reliable data seem to suggest that the distribution of *B. nubivaga* is restricted to the Alps. However, more records are needed to sustain this hypothesis.

Details of sampling stations.—(Number of specimens in parentheses); habitat; elevation; UTM coordinates; % soil cover of an area of 20m radius centered on the pitfall trap; additional species (number of specimens in parentheses). Sampling station 1: (1 ♂) Ski slope; 1956 m; UTM 32T3869155073792; S-SE; 80% grass, 10% stones, 10% bare ground; *Alopecosa aculeata* (Clerck 1757) (1); *Pardosa blanda* (C.L. Koch 1833) (72). Sampling station 2: (1 ♂) Larch wood; 2017 m; UTM 32T3868335074188; S; 80% shrubs, 20% grass; *Alopecosa*

aculeata (Clerck 1757) (1), *Drassodes cupreus* (Blackwall 1834) (1), *Haplodrassus signifer* (C.L. Koch 1839) (2).

Sampling station 3: (1 ♂) Larch wood; 1995 m; UTM 32T3869205074160; S-SE; 50% grass, 50% shrubs; *Aelurillus v-insignitus* (Clerck 1757) (1), *Alopecosa aculeata* (Clerck 1757) (1), *Drassodes cupreus* (Blackwall 1834) (2), *Haplodrassus signifer* (C.L. Koch 1839) (2), *Haplodrassus umbratilis* (L. Koch 1866) (1), *Pardosa blanda* (C.L. Koch 1833) (1), *Xerolycosa nemoralis* (Westring 1861) (1), *Zelotes talpinus* (L. Koch 1872) (2). Sampling station 4: (2 ♂♂) Alpine pasture; 1912 m; UTM 32T3870345073985; SE; 100% grass; *Alopecosa accentuata* (Latreille 1817) (2), *A. cuneata* (Clerck 1757) (2), *Drassodes cupreus* (Blackwall 1834) (3), *Haplodrassus signifer* (C.L. Koch 1839) (2), *Pardosa bifasciata* (C.L. Koch 1834) (1), *P. blanda* (C.L. Koch 1833) (12), *P. mixta* (Kulczynski 1887) (4), *P. palustris* (Linnaeus 1758) (8), *P. riparia* (C.L. Koch 1833) (1), *Xerolycosa nemoralis* (Westring 1861) (4). Sampling station 5: (1 ♂) Alpine pasture; 1937 m; UTM 32T3885185075228; N; 100% grass; *Alopecosa cuneata* (Clerck 1757) (1), *Arctosa figurata* (Simon 1876), *Drassodes cupreus* (Blackwall 1834) (3), *Pardosa bifasciata* (C.L. Koch 1834) (1), *P. mixta* (Kulczynski 1887) (4), *Zelotes* sp. (2). Sampling station 6: (1 ♂) Edge wood-pasture; 1902 m; UTM 32T3871905074040; E; grass 100%; *Drassodes cupreus* (Blackwall 1834) (3), *Xysticus niuii* Thorell 1872 (1), *Haplodrassus signifer* (C.L. Koch 1839) (3), *Pardosa blanda* (C.L. Koch 1833) (10), *Alopecosa cuneata* (Clerck 1757) (1), *Zelotes electus* (C. L. Koch 1839) (1). Sampling station 7: (2 ♀, 5 ♂♂) Alpine pasture; 1915 m; UTM 32T3872275074229; E; 85% grass, 15% stones; *Alopecosa aculeata* (Clerck 1757) (3), *Arctosa renidescens* Buchar & Thaler 1995(1), *Drassodes cupreus* (Blackwall 1834) (2), *D. pubescens* (Thorell 1856) (1), *Haplodrassus signifer* (C.L. Koch 1839) (4), *Micaria fulgens* (Walckenaer 1802) (1), *Pardosa blanda* (C.L.

Koch 1833) (28), *P. palustris* (Linnaeus 1758) (1), *Steatoda phalerata* (Panzer 1801) (2), *Xysticus gallicus* (Simon 1875) (2), *X. nimis* Thorell 1872 (2).

ACKNOWLEDGMENTS

The authors would like to thank sincerely Theo Blik, Christo Deltshv, and Paolo Pantini for the very useful discussion on the distribution of this species. We are also grateful to Sanne Beikes for help on the identification and to Massimo Meregalli for help with the illustrations.

LITERATURE CITED

- Blagoev, G. 2002. Check list of Macedonian spiders (Araneae). *Acta Zoologica Bulgarica* 54:9–34.
- Caporiacco, L. di. 1926. Secondo saggio sulla-fauna aracnologica della Carnia e regioni limitrofe. *Memorie della Società Italiana di Entomologia* 5:70–130.
- Dalmas, R. de. 1921. Monographie des araignées de la section des *Pterotricha* (Araneae Gnaphosidae). *Annales de la Société entomologique de France* 89:233–328.
- Deltshv, C. & G. Blagoev. 2001. A critical checklist of Bulgarian spiders (Araneae). *Bulletin of the British Arachnological Society* 12:110–138.
- Di Franco, F. 1997. New considerations about the gnaphosid fauna of Italy (Araneae: Gnaphosidae). *Bulletin of the British Arachnological Society* 10:242–246.
- Drensky, P. 1915. Araneides nouveaux ou peu connus de Bulgarie. *Spisanie Na Bulgarskata Akademiya Na Naukite* 12:141–176.
- Drensky, P. 1936. Katalog der echten Spinnen (Araneae) der Balkanhalbinsel. *Spisanie Na Bulgarskata Akademiya Na Naukite* 32:1–223.
- Grimm, U. 1985. Die Gnaphosidae Mitteleuropas (Arachnida, Araneae). *Abhandlungen des Naturwissenschaftlichen Vereins in Hamburg* 26:1–318.
- Levy, G. 1999. Spiders of six uncommon drassodine genera (Araneae: Gnaphosidae) from Israel. *Israel Journal of Zoology* 45:427–452.
- Nikolić, F. & A. Polenec. 1981. *Catalogus Faunae Jugoslaviae. Consilium Aeademiarum Scientiarum Rei Publicae Socialisticae Foederativae Jugoslaviae* 3/4:1–135.
- Pesarini, C. 1995. Arachnida Araneae. Pp. 1–42. *In* Checklist delle Specie della Fauna Italiana, Volume 23. (A. Minelli & S. La Posta, eds.). Calderini, Bologna.
- Platnick, N.I. 2007. The World Spider Catalog, Version 7.5. American Museum of Natural History, New York. Online at <http://research.amnh.org/entomology/spiders/catalog/INTRO1.html>.
- Simon, E. 1878. *Les Arachnides de France*, Volume 4:1–334. Roret, Paris.
- Simon, E. 1914. *Les Arachnides de France. Synopsis générale et catalogue des espèces françaises de l'ordre des Araneae*, 1^{re} partie, Volume 6:1–308. Roret, Paris.
- Trotta, A. 2005. *Introduzione al ragni italiani (Arachnida Araneae)*. *Memorie della Società Entomologica Italiana* 83:3–178.

Manuscript received 2 May 2007, revised 23 September 2007.